

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, ex rel,	)	
W.A. DREW EDMONDSON, in his	)	
capacity as ATTORNEY GENERAL	)	
OF THE STATE OF OKLAHOMA,	)	
et al.	)	
	)	
Plaintiffs,	)	
	)	
V.	)	No. 05-CV-329-GKF-SAJ
	)	
	)	
TYSON FOODS, INC., et al.,	)	
	)	
Defendants.	)	

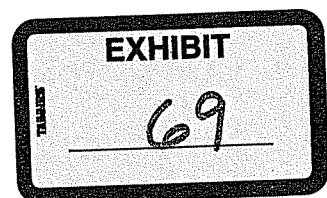
REPORTER'S TRANSCRIPT OF PROCEEDINGS  
FEBRUARY 19, 2008  
PRELIMINARY INJUNCTION HEARING  
VOLUME I

BEFORE THE HONORABLE GREGORY K. FRIZZELL, Judge

APPEARANCES:

<u>For the Plaintiffs:</u>	Mr. Drew Edmondson
	Attorney General
	Mr. Robert Nance
	Mr. Daniel Lennington
	Ms. Kelly Hunter Burch
	Mr. Trevor Hammons
	Assistant Attorneys General
	313 N.E. 21st Street
	Oklahoma City, Oklahoma 73105

Glen R. Dorrough  
UNITED STATES COURT REPORTER



1	(CONTENTS CONTINUED)	Page No.
2	Cross-Examination by Mr. Ryan.....	97
3	Redirect Examination by Mr. Edmondson.....	144
4	Recross-Examination by Mr. Ryan.....	148
5	BARRY ELLIS WINN	
6	Direct Examination by Mr. Bullock.....	160
7	Cross-Examination by Mr. Tucker.....	166
8	CHRISTOPHER M. TEAF	
9	Direct Examination by Mr. Bullock.....	183
10	Cross-Examination by Mr. Tucker.....	226
11	- - - - -	
12	<u>PROCEEDINGS</u>	
13	February 19, 2008	
14	THE COURT: Be seated, please.	
15	THE CLERK: We're here in the matter of the Attorney	
16	General of the State of Oklahoma, et al, vs. Tyson Foods, Inc.,	
17	et al, Case Number 05-CV-329-GKF. Would the parties please	
18	enter their appearance.	
19	MR. BULLOCK: Louis Bullock for the State of Oklahoma.	
20	MS. BURCH: Kelly Burch, State of Oklahoma.	
21	MR. NANCE: Bob Nance for the State of Oklahoma.	
22	MR. BAKER: Fred Baker for the State of Oklahoma.	
23	MR. GARREN: Richard Garren, State of Oklahoma.	
24	MR. PAGE: David Page, State of Oklahoma.	
25	MR. EDMONDSON: Drew Edmondson, State of Oklahoma.	

1 appropriate time to do our update of the daily copy? We'll  
2 take about a five to ten minute recess at this time.

3 (Recess.)

4 THE COURT: Mr. Bullock, you may call your next  
5 witness.

6 MR. BULLOCK: Dr. Christopher Teaf.

7 CHRISTOPHER M. TEAF

8 Called as a witness on behalf of the plaintiffs, being first  
9 duly sworn, testified as follows:

10 THE COURT: Doctor, if you would state your full name  
11 for the record, please.

12 THE WITNESS: My name is Christopher M. Teaf, T-E-A-F.

13 THE COURT: Thank you very much. You anticipated my  
14 next question. Mr. Bullock.

15 DIRECT EXAMINATION

16 BY MR. BULLOCK:

17 Q. By whom are you employed and in what capacity?

18 A. I'm the associate director of the Center for Biomedical  
19 and Toxicological Research at Florida State University in  
20 Tallahassee. I'm also the president and director of toxicology  
21 for hazardous substance and waste management research.

22 Q. Could you state please the highlights of your professional  
23 activities and responsibilities at Florida State?

24 A. At Florida State University I have administrative,  
25 teaching and research responsibilities. My administrative

1 responsibilities involve staff oversight. My position is a  
2 research position, therefore I have oversight over the research  
3 that goes on in the toxicology and risk assessment arena for  
4 the center. That involves risk assessment for contaminated  
5 sites or for industrial facilities and for individuals who may  
6 have occupational exposures, environmental exposures, that type  
7 of thing. The area of teaching involves toxicology, risk  
8 assessment, water quality, environmental quality, environmental  
9 chemistry.

10 Q. And what is your area of research?

11 A. The areas I've been working in for the past 25 years have  
12 been human health risk assessment from environmental  
13 contaminants in air, soils, groundwater, surface water, all  
14 environmental media.

15 Q. Do you hold any appointments at any other educational  
16 institutions?

17 A. Yes, I hold an adjunct appointment presently at Florida  
18 A&M University which is also located in Tallahassee. And I  
19 have previously held that position for a number of years. I've  
20 also been in the adjunct faculty at the University of Arkansas  
21 For Medical Sciences in Little Rock periodically.

22 Q. How recently for that?

23 A. Probably 15 years.

24 Q. Do you serve on any professional advisory boards or  
25 technical committees and if so, which would you highlight?

1 Q. What are you talking about in terms of the very large  
2 quantities of poultry waste?

3 A. The number that I have -- I believe to be correct is about  
4 340 or 345,000 tons a year, about 700 million pounds a year  
5 being generated within the watershed.

6 Q. Number 3, the high levels of bacteria, what's the  
7 importance of that in the conclusion that the source is poultry  
8 waste?

9 A. Again, the very high levels of the same kinds of bacteria,  
10 the same indicator organisms, in this instance, Enterococci, E.  
11 coli and fecal coliforms in the poultry waste, the edge of  
12 field samples I mentioned a moment ago which are undeniably  
13 coming from an immediately adjacent field, and then the nearby  
14 surface waters as well. So you are looking for a linkage of  
15 the same types of organisms.

16 Q. Now, the next one is the mass of fecal matter from the  
17 poultry. Explain what you're talking about in No. 5.

18 A. Well, the source contribution issue that has come up a  
19 time or two today has been looked at, we've looked at that.  
20 And in my view and based on the calculations that we have done,  
21 we can identify the fact that poultry are at least as great and  
22 perhaps a greater contribution than cattle in the Illinois  
23 River Watershed. It's true that there are other potential  
24 sources. Swine are a small contributor, probably 10 percent or  
25 less. Wastewater treatment plants are a small contributor,

1 less than a percent. So you have a variety of potential, but  
2 not significant sources.

3 But what's at least as important as the numerical  
4 value, the numerical bacterial loading, is how that material is  
5 being distributed and applied. Cattle, for example, have fecal  
6 matter which is much different than poultry. It's large. It's  
7 got a small surface area to volume ratio. It tends to stay in  
8 one place. It tends not to leach when it's deposited on the  
9 ground. The issue of deposition of water today certainly  
10 occurs, but its significance is not clear. I don't think it's  
11 been looked at in a way that will allow you to refine that  
12 understanding of the significance.

13 Poultry litter, on the other hand, or poultry waste is  
14 applied in large quantities on focused areas over a short  
15 period of time in the year during which nearly half of the  
16 rainfall for the year occurs, the months of February through  
17 June, let's say.

18 Q. Okay. Doctor, you talked about the nature of cow patties.  
19 I'm sure most of us who have walked in the field are aware of  
20 those and I didn't bring one today as a demonstrative.

21 A. Thank you.

22 Q. We do have, courtesy of the defendants, some poultry  
23 litter. What are the characteristics about the poultry litter  
24 which are related to your number 5?

25 A. Well, as you can see from this example, poultry litter is

1 a much more finely divided, more -- I guess you would almost  
2 say powdery material. There is some larger material to it, but  
3 it's largely small particulates which have two differences  
4 there from cattle waste. One is that they're much, much  
5 smaller. Their surface to volume ratio is much different.  
6 They're much more easily moved, that is by water and runoff.  
7 And they're much more easily leached, that is the material, the  
8 bacteria, the phosphorus, whatever else is in them is more  
9 easily leached than a single unitary cow pie.

10 Q. On your trips to the river, did you ever see cow patties  
11 floating down?

12 A. No, I did not.

13 Q. What about number 6, Doctor, which was the PCA that  
14 Dr. Olsen will testify in. Is that part of your line of  
15 evidence?

16 A. Yes, it is.

17 Q. And what part of that do you rely upon?

18 A. The conclusions that he's reached with regard to the  
19 frequency of principal component analysis indicating the  
20 chicken fingerprint or signature is very great in those samples  
21 that have shown exceedances of bacterial criteria. So if you  
22 select samples where the bacteria are a problem and you ask the  
23 question is this poultry, the answer in 85 percent of the time  
24 is yes. So I can't tell you it's 100 percent of the time, but  
25 that's not the issue. The issue is what's the dominant

1 contributor here and it's clearly poultry waste.

2 Q. And finally, you have the bacterial source tracking by  
3 Dr. Harwood?

4 A. Yes, Dr. Harwood has prepared a biochemical/genetic marker  
5 that allows the identification of similar bacterium in water as  
6 was found in chicken litter, chicken waste.

7 Q. Now, just to make certain that I'm clear, are all of  
8 these, all seven of these lines of evidence necessary for your  
9 opinion -- for you to view your opinion as being valid?

10 A. No, I've listed those for which I believe there is some  
11 contributory factor. That is if one of these were to  
12 disappear, it wouldn't invalidate the conclusion. I've just  
13 tried to be as complete as I can in terms of those things that  
14 have factored into my opinion that the dominant contributor and  
15 the significance of this is poultry waste.

16 Q. Let's put up 402, please. What is 402?

17 MR. ELROD: 401, Louis?

18 MR. BULLOCK: 402.

19 A. 402 represents a combined graph that shows two things. It  
20 shows in the blue lines the monthly land application of poultry  
21 waste in the Illinois River by percent, percent by month. And  
22 from that you can see that the months of February through June  
23 represent a dominant proportion of the year's annual  
24 application. That's the right-hand Y axis and the blue line.

25 The left-hand Y axis and the red line is the usage of



1 the river by month by floaters as identified in Dr. Caneday's  
2 evaluation. And what you can see from that is that the months  
3 of May through September represent the vast majority of  
4 activity on the Illinois River from a recreational standpoint.  
5 And the important point here -- or I guess there are two  
6 important points. One is that the dominant application period  
7 immediately precedes the recreational use period and that  
8 there's at least a two-month overlap, May and June, where  
9 there's a large proportion of -- or a large quantity of land  
10 application of poultry waste still going on and you have the  
11 initial tens of thousands of people using the Illinois River.  
12 So you can see that there's a temporal relationship between  
13 these which is not advantageous from a standpoint of human  
14 health.

15 Q. (By Mr. Bullock) Okay. If we go back and we can roughly  
16 see where the latter part of February is on this graph where we  
17 stand today.

18 A. Yes.

19 Q. Does the -- in light of the fact that today the  
20 recreational users are really at just about its lowest point  
21 for the whole year, does that relieve your concern about what  
22 might be going on today?

23 A. No, it doesn't. It certainly, from an individual  
24 standpoint, your likelihood of having an individual exposed is  
25 much less now, but you have the application period is now and

1 the recreational period is soon. Therefore, they're not  
2 separate in time and they have to be considered together,  
3 particularly given the rainfall, the 45 or so percent of  
4 rainfall that falls in the spring period.

5 Q. Do you have any issue with the persistence of bacteria in  
6 the environment?

7 A. Well, as we talked about a few moments ago, there are  
8 certain kinds of bacteria, particularly important infectious  
9 bacteria, that are relatively easily able to survive in the  
10 environment, certainly for periods of weeks or months. And  
11 that period can be extended dramatically by sequestration of  
12 sediment or by sequestration in larger pieces of fecal matter  
13 which subsequently break down as they're in the environment for  
14 a while. So it's true that bacteria are subjected to stresses,  
15 but bacteria aren't so bad at getting along with stresses. And  
16 so you have adaptive mechanisms, you have this viable but non  
17 culturable state which allows the bacteria to remain viable or  
18 remain alive, but not culturable. So I think there's a  
19 temporal problem there as well.

20 Q. Let's talk about groundwater wells. Let's put up 401.  
21 What is 401, Doctor?

22 A. 401 is, again, the base map of the Illinois River  
23 Watershed, both the Oklahoma portion and the Arkansas portion,  
24 which identifies the fact that there are over 1,700 wells in  
25 the Oklahoma portion of the IRW.